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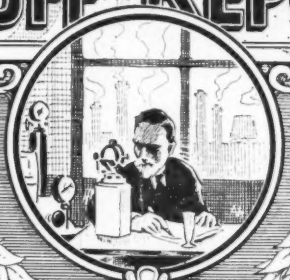
AMERICAN DYESTUFF REPORTER

Vol. IV, No. 7 Feb. 17, 1919



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ESTABLISHED 1872

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AMERICAN DYESTUFF REPORTER

A Weekly Publication devoted to

DYESTUFFS, COLORS and ALLIED CHEMICALS

"Circulated Everywhere Dyestuffs are Used"

Vol. 4 New York, February 17, 1919 No. 7

WHAT TO CALL A SPADE

Those Who Say "Tariff" When They Mean "Licensing Commission" Should Alter Their Phraseology to Conform With New Conditions

TO "call a spade a spade" is an expression which is ever used to signify praiseworthy economy of speech and businesslike bluntness. It is a very eloquent expression, well deserving the respect accorded it in the United States, a nation of workers. The principle which it expounds, if one can believe the copy-books, should be carefully cultivated and made a habit of by every young American ambitious to grow up and be a sales shark or business hound, like papa.

But shucks! We knew a man who was a phenomenal success and who never by any chance called a spade a spade. He was entirely self-made, too, and in his youth had gone through hardships enough to have killed a regiment of Turkish soldiers. He fought his way up the ladder, one round at a time—we might almost say by a series of battles, one round at a time—from the ranks of an iron-jawed, hard-hitting aggregation of prize roughnecks where direct and forcible speech, shorn of all frills, was the only kind ever heard, and at this very moment he has enough Liberty Bonds to stuff a mattress, with plenty left over for a pair of pillows.

Well, anyway, this man invariably calls a spade a d——d shovel! Not for him such a highfalutin', fancy term as "spade" to describe an implement which he thinks of only in the manner set forth above. To him, a spade *is* nothing more or less than a d——d shovel, and so, with true and characteristic frankness, that is just what he calls it. And if he called it a spade, as the exponents of brevity recommend, it would simply be a silly affectation on his part.

The business men of America have long been calling a spade a spade when they really meant a "d——d shovel." Like certain parts of Washington's farewell address, when the causes which call into being a popular expression disappear, the expression itself lingers to confuse the minds of the succeeding generation. Circumstances alter cases, and just as the clauses in the Washingtonian *adieux* which speak of foreign relations have been pretty well outgrown by this time, so have our grandfathers' notions regarding the tariff. The war, say the savants of to-day, has changed everything, and inasmuch as for some time past both dye manufacturers and consumers have been talking about a tariff spade and thinking about a licensing shovel, it is

high time the name was altered to properly express the thought.

Everyone knows well enough that the very best kind of a tariff measure which would stand a chance of passing Congressional inspection could not hope to be a serious obstacle to Germany's reorganized business offensive. We must have a tariff, naturally, just as armies must have a second and even a third line of trenches. But the purposes for which it was originally designed have simply outgrown it, together with the old-fashioned horror of improving upon a tried and true system of commercial defence, and there is no good reason for mincing matters by saying "spade" when we mean "d——d shovel."

Yet habit is a hard thing to outgrow, and we still find a number of reputable and up-to-date textile journals urging their trusting subscribers to spread and support propaganda for a "high tariff." This is right and commendable. But we object to the phraseology. Their object, and the subscribers' object—and our object—are one, this being the proper protection of the American dye industry. And no one can long think of ideal ways for the accomplishment of this without beginning to form in his mind a hazy outline of some such plan as we find crystallized in the proposed licensing scheme. We'll get the highest possible tariff anyway; Dr. Taussig and his commission will see to that. Therefore we may as well stop worrying about it, and wondering if it could be made just a leetle mite higher, mebbe—for it could not. But we can, by taking thought, add more than a single cubit to our industrial stature if we can begin to think aloud about a licensing system. But we must thing very hard and very loudly; these are noisy times and there are many other worthy thoughts clamoring for immediate attention. We must drape the term "licensing commission" in graceful festoons around and through the nouns, verbs and adjectives of our daily conversation; we must pronounce it clearly and distinctly at meetings of the trade, and we must speak freely of it in letters to the fearless and gentlemanly editor, in order that more people may get used to hearing it and seeing it in print. If the expression refuses to be articulated smoothly the first few times, practice saying it before your mirror for five minutes in the morning. It will soon slip out as easily as "discount" and "repeat order."

Carl Zeiss, of Jena, Austria, used to make some of the very best lenses obtainable anywhere. No doubt he still does, but he hasn't been able to send any to this country for some time past. Perhaps Germany has been easier of access; at any rate it is safe to assume that there are plenty of Zeiss lenses in Berlin. Let the reader, then, imagine himself for a few minutes to be a Hun. He is standing, we will suppose, in the Wilhelmstrasse. In his hand he holds a pair of Zeiss field-glasses. After sweeping the horizon for an instant, he turns them full upon America, and with German eyes, through Hun-made glasses, beholds the land of his nativity. At once his erstwhile American mind begins to function as a German's.

He sees a hive of industry, and, among other things, huge plants turning out an ever-increasing number of coal-tar dyestuffs. He snorts with delight. "America," he cries, "is a commercial capon! This Schoolmaster who presides in Washington is the prince of puerility—the 'ace' of asses! They can no more compete with the efficiency of the Fatherland than they ever could. It will be the old story just as soon as we are ready to send them our dyes." He views the country for signs of hostile measures, observes

the united advocacy of a high tariff and says "It iss to laugh!" for he knows that the German color combine can gleefully leap over the highest tariff wall that ever could be erected. He knows that when the Americans first began to make dyes the seven members of the combine drew closer together, agreed to share all losses and profits equally, and undersold the impudent Yankees ruthlessly in order to crush the threatened competition at once. He knows that this same combine has just renewed this agreement for fifty years with an eye to preventing any further growth of the dye industry in America, and knowing, pities the simpletons who would think a heightened tariff sufficient to save them.

But supposing, on the other hand, he saw dye manufacturers, dealers and consumers together demanding the creation of a commission with powers to prohibit him from sending over such dyes as were already being made in America. He would know that the demand was certain to be granted, and knowing, pity himself instead of the Yankees, for he could not but realize that this was a horse of a different color. No pleading, no price-cutting and no amount of bribery could hope to get a single pound of forbidden synthetic dye into the United States, and thus his principal weapons would be taken out of his hands. The only alternative would be the creation of new colors made from "secret" formulae which the Yankees could not fathom, and there is now no hope of this since American chemists are at last thoroughly "on the job" of producing dyes. He would realize that he might as well abandon the attempt to win back his former potency in the dye trade, so far as this country is concerned, and thereby save himself and us a deal of worry and trouble.

That he at present cherishes hopes of doing so must not be doubted. German militarism is killed, but German arrogance is not, as is plainly indicated by Germany's triumphal reception of her "unbeaten armies"! This arrogance, too, will some day disappear, but for the time being it lingers.

It is only necessary, then, to see the situation through German glasses in order to understand fully just how great a dash to German hopes a loudly proclaimed and universal demand for a licensing commission would be. "Put yourself in his place" became the text of a very famous novel, and a little practice of this art in situations such as the American dye industry finds itself to-day should provide the necessary stimulus for action

The United States Tariff Commission, one of the sincerest and most potent friends of the industry in this country, has recently complained that after sending out questionnaires to 269 dye manufacturers in order to prepare next year's census of dyes and coal-tar chemicals, and after following these up with a special letter urging these manufacturers to respond with the requested data, it has received satisfactory answers from only sixty, or less than

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twenty-five per cent. This is not right, but the manufacturers cannot be blamed, under present conditions, for not wanting foreign dyestuff manufacturers to know what they are making or preparing to make. With a licensing commission, however, the productions of each company could become an open book, and thus another obstacle to better organization for the capture of foreign markets could be disposed of.

The eyes of Germany are upon the American dyestuff industry, and soon our own Congress will have its ear to the ground for indications of its desires. Now is the time to make a little noise, and to call that spade a "d——d shovel," if we have come to think of it as such, for the licensing commission will never be anything but a vague and beautiful dream unless we begin to talk about it and forget the traiff.

GRASSELLI ANNOUNCES ACQUISITION OF BAYER DYE INTERESTS

The Grasselli Chemical Company, New York, has sent out the following announcement to the trade:

"We have acquired the dyestuff business of the Bayer Company, Inc., including its dyestuff factory at Rensselaer, N. Y., its sales organization, branch offices and warehouses, including its stocks of finished and unfinished products; also all the American patent rights in the dyestuff and allied lines of both the Bayer Company and the Synthetic Patents Company. We have also acquired the property of the Williams & Crowell Company, of Providence, R. I.

"This branch of our business will hereafter be known as the 'Dyestuff Department' of the Grasselli Chemical Company. Both the manufacturing and sales departments of our organization are at your disposal, and we solicit your co-operation in our endeavor to develop an American dyestuff industry in our mutual interests.

"We will continue to maintain dye laboratories in New York and at our sales agencies in order to be of assistance in solving our customers' problems.

"The head office of the 'Dyestuff Department' is located at 117 Hudson Street, New York City, with branches as follows: Boston, Mass., 32 India Street; Providence, R. I., 56 Pine Street; Philadelphia, Pa., 908 Chestnut Street; Chicago, Ill., 146 West Kinzie Street; Birmingham, Ala., Brown-Marx Building; Toronto, Ont., 512 Royal Bank Building; Montreal, Que., 49 Reading Street and Point St. Charles, where all communications and inquiries relating to dyestuff should be addressed."

FRED WETZEL & CO. N.Y.

AMERICAN DYES

Can They Compete with Foreign Products?

Many people have asked whether the American dyes are equal to the German dyes formerly imported. The idea that we were not able to make dyes as good as the Germans originated because of conditions prevailing at the beginning of the great war. As the stock of foreign dyes became exhausted the domestic dyer was forced to use any available dye, and he thereupon used, for cotton, dyes which were intended for wool, and vice versa, because the dyes which he required were not obtainable.

The making of colors is a highly specialized business. Colors are not alone made for particular shade, but for dyeing particular fabrics a certain shade, and they are further subdivided so that they dye a particular fabric for a particular purpose. We

speak now of proper dyeing. Some colors will dye cotton, wool or silk equally well, but they are rare and exceptional. The vast majority of colors will dye either cotton, silk or wool properly; that is, will show a brilliant shade, will not fade in the wash and will have other necessary good qualities. Cotton colors dye cotton; silk colors dye silk; wool colors dye wool.

If cotton is dyed with logwood black, a black will be obtained which might appear as good as a black obtained by dyeing with sulphur black, which is the proper black for certain cotton; but the logwood black will not be fast to perspiration and will tend to crock, and will have many bad qualities which the sulphur black will not have. On the other hand, if you use the logwood black for silk or wool it will be fast, and will stand slight acid or alkaline reactions, and will be bright, besides adding feel or hand; whereas, if you use sulphur black for silk or wool the results would be very bad.

At this time, when the American aniline industry is assuming large proportions, and when new colors are being evolved constantly, it is important that our people should know the truth about this new American industry. It must also be remembered that aniline color manufacture is only one branch (although a very important one) of the organic chemical industry. The production of explosives, illuminating and fuel oils, natural and artificial remedies for disease, photographic materials, margarine, soap, rubber, perfume, artificial silk, and celluloid, whether inflammable or non-inflammable, is intimately connected with the principles and practice of organic chemistry, while the production of spirituous liquors, dairy produce, meat extracts and cereal foods has undergone marked improvement in consequence of applying this branch of knowledge to its control. The general public should know that organic chemistry, which is a distinct section of science, and of which aniline color manufacture is only one branch, is expanding along proper lines in America. We may confidently hope, if given a reasonable time, to be able to compete in price as well as in quality with anybody throughout the world, providing we have proper protection covering the cost of basic raw materials and labor.

The American chemist will not be found wanting, nor will the American concern engaged in this business lack the initiative and good management which have distinguished the American business man.

With a capital of $50,000, the Norristown Hosiery Mills have been incorporated under the laws of Pennsylvania and have begun operations as manufacturers of women's boot silk hosiery, 260-needle goods. The plant of the concern is at Norristown, Pa.

American Aniline Products, Inc.
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Works: Nyack, N. Y.

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Union Colors for Mixed Goods
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Alizarine Yellow
Alizarine Brown

Basic Colors

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AMERICAN DYESTUFF REPORTER
Published weekly by
HOWES PUBLISHING COMPANY
470 Fourth Avenue, New York

Pointed solely toward the welfare and growth of the American Dyestuff Industry. Unbiased contributions appreciated.

A. P. HOWES, Publisher
LAURANCE T. CLARK, Editor

Domestic Subscription, $3 per year. Foreign, $4.
Advertising rates on request.

SWISS MIGRATION

We have received, from what we believe to be an eminently reliable source, information to the effect that a committee representing various Swiss dyestuff manufacturers will leave for America early in April with a view to preparing the way for a removal of considerable portions of their plants to this country. It is the idea of the Swiss manufacturers, we are told, to remove hither not only their machinery but their personnel as well.

This action is prompted, of course, by a desire to avoid duties and so compete for American business on an even footing. It may be, also, that the possibility of Congress authorizing a licensing board weighed in the decision. Whatever the reason, we see in this contemplated action the greatest possible compliment to the position of the American dyestuff industry. Imitation is surely the sincerest form of flattery, and if the Swiss manufacturers were not pretty well satisfied that our own industry had come to stay they would hardly be inclined to throw in their lot with ours.

THE SAMPLE NUISANCE

Dyestuff dealers and manufacturers waste thousands of dollars a year in samples which are never tested. One of the methods used by the average buyer of dyestuffs to get rid of a persistent salesman is to tell him to send samples of certain dyestuffs. When they arrive, they are either thrown away or saved for future use.

We do not believe that there is any disposition on the part of the users of dyestuffs to actually profit by the samples they receive. Nevertheless, there are a number of smaller dyers who do use samples thus obtained.

One of the largest print houses in this country always returns samples when they are not sufficiently interested in the dyestuff submitted to make a test. If all of the consumers in the country were to institute this method, it would result in a big saving to the dealers and manufacturers of dyestuffs and would create a much better feeling all around.

It would seem as if it were no more than courtesy to acknowledge receipt of samples, and, if they are tested, to give the results of the test. This cannot possibly do the dyer any harm, and it would be vastly to his advantage if he only would stop to think about the matter.

If, for instance, a dealer submits samples of a certain color and they fail to please, either through not being the correct shade or strength, this information would be of great value in submitting future samples, and would give the dealer or manufacturer a better opportunity to meet the requirements of the dyer.

If consumers generally would make up their minds not to ask for samples of dyestuffs which they do not require, to return those which they receive in which they are not interested, and to make a report on those which they do test, it would certainly lighten the burden of the dealer and the manufacturer and would save an unnecessary expense which, in the aggregate, runs into very large figures and which is ultimately borne by the consumer himself as part of the cost of doing business. Moreover, such a policy would be distinctly in keeping with the national campaign for the avoidance of waste, and would result in a very considerable conservation of dyestuffs.

SULPHUR DYESTUFFS FOR FAST PRINTING

By E. Greenhalgh, A.M.S.T.

A new era has dawned in the calico printing industry in which old methods, old styles and old fancies are abolished, and are superseded by up-to-date processes and ideas, no longer relying on the skill of old-fashioned, conservative producers who could imitate a shade wonderfully but could not produce anything new. Brilliant colors and shades which faded on the first day of sunshine and paled away before the contents of the washtub are now no longer sought after, but fast colorings possessing a pleasing brightness and uniqueness are gradually taking their place. The loose color will have a very limited scope in the near future, and in time will be entirely displaced by the fast color.

Such a series of fast colors, which are now coming into prominence in printing, are the sulphur dyestuffs, which contain practically every requisite shade except red, and there is not a great difference between the sulphur dyestuffs and some of the indigoid vat reds which are, after all, only glorified sulphur colors. The difference in price of many colors has led manufacturers to think that with high cost of dyestuffs there must necessarily be increased fastness, and vice versa for the low-priced goods. This is quite an erroneous idea. Many of the sulphur dyestuffs are faster in every respect than some of the indigoid vat dyestuffs.

A Drawback

One of the great drawbacks of the present-day sulphur colors is the presence of a certain amount of free sulphide in the paste, which in the printing process attacks the copper rollers severely, even partially effacing the engraving after long periods of use. The calico printer has been forced, however, to return to these colors to fill up the gaps in his range of fast colors, and has made representations to the color manufacturers as to his requirements. Consequently there have been improvements in a few sulphur colors, so that in time calico printers will use this useful class of color very largely.

At present the chief dyestuff of the class which is guaranteed to undergo the calico printing process is sulphur black paste of a strength about 50 per cent of the type used for dyeing purposes. This paste is quite finely divided, and should keep for quite a long period without any alteration in its physical state, as contrasted with the pastes used for dyeing, which often set hard in two or three months' time.

The application of these colors to textiles can be effected in various ways, and although the price of the color is often much below that of the indigoid dyestuffs, it does not necessarily follow that the method of ap-

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METHYL VIOLET BASE
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plication should be the cheapest possible, providing that a process a little more expensive gives an infinitely better result. The process, usually resorted to, for the printing of these colors is that of using glucose and caustic for the reducing agent. This process gives very fair results, but in the finished print there always appears a certain amount of flatness and, in contrast with other dyestuffs printed at the same time, the color does not stand out boldly, as it ought to do. A more expensive method is that of utilizing Formosol as the reducing agent; and though a little more trouble and cost is required, the brightness and fullness of the finished article more than compensates. The proportion of reducing agent to color is, roughly, 4 to 1 using glucose and 5 to 2 using Formosol—in fact, about the same proportions used for indigoid vat dyestuffs.

An example of the glucose alkali process is given in the following recipe, using sulphur black paste for printing:

THICKENING

	Parts
Dextrine	300
Corn starch	50
Water	150

COLOR PASTE

	Parts
Sulphur black paste	100
Glucose, 40 per cent	200
Caustic soda, 76 deg. Tw	100
Thickening	600

Allow to stand with repeated stirring till dissolved and wholly reduced. Print dry and steam in the rapid ager for two to three minutes at 100 deg. to 101 deg. Cent. Allow to hang in moist atmosphere for at least one hour, oxidizing in ⅛ per cent bichrome and 1 per cent sulphuric acid. Soap ten minutes at the boil.

A corresponding recipe for this color, whereby brighter and fuller shades are obtained, is given by the following:

THICKENING

	Parts
Dextrine	300
Corn starch	50
Soda ash	50
Water	200

Heat to 160 deg. Fahr. and cool.

COLOR PASTE

	Parts
Sulphur black	100
Glycerine	100
Water	100
Thickening	600
Formosol 50 per cent solution	100

The color is printed, dried and aged four to five minutes at 102 deg. to 103 deg. Cent., and finally hung and oxidized as for the glucose alkali process.

Sulphur Colors Containing Free Sulphide

As it is a necessary fact that sulphur colors should be free from sulphide when required for printing, so it is imperative that this sulphide be removed before printing. To attain this end, many calico printers have made an addition of bisulphite and sulphite to the printing pastes. This has the tendency to eliminate the action of the sulphide, but its effect is only temporary, and after a short period—say, for one to two hours running of the printing machine—the sulphide begins to reassert itself.

Various methods have been suggested of desulphurizing this class of colors, and three of them are fairly inexpensive and easy to conduct in an average print works. The simplest of these processes is washing with hot water which has been slightly

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acidulated. This process, however, takes a long period and a large volume of liquor before the last trace of sulphide disappears. A second method consists in boiling the color with sulphite of potash and thiosulphate of potash for a short period, then acidifying with hydrochloric acid or sulphuric acid, and subsequently filtering and washing. In this country this process is not made use of owing to the high cost of sulphites, especially of potash. By this method, however, every trace of sulphide is taken out, leaving a pure color paste in a very fine form suitable for calico printing. A similar result can be obtained by using the sodium salts. The reaction which takes place with the sulphide is the formation of free sulphur, which is taken up by the sulphite forming thiosulphate. A third method of eliminating the free sulphur is that of oxidizing very carefully with either hydrogen peroxide or sodium peroxide. The color is dissolved in boiling weak caustic soda, allowed to cool somewhat, and about 5 per cent of hydrogen peroxide (10 vol.) is run slowly in, while the color solution is repeatedly stirred. After the peroxide has been added the solution is boiled, acidified, filtered and washed. The paste on the filter is very finely divided, and after being standardized can be used right away.

Previous to the outbreak of war, most of the sulphur colors, excluding blacks, contained about 2 per cent to 3 per cent free sulphide. As, however, the sulphide colors are usually printed in shades of 3 per cent to 10 per cent dyestuff for ordinary shades, the presence of this small percentage of free sulphide could not be ignored. The sulphide colors of to-day are just about the same, and in case a certain color is required it is advisable to test for free sulphur or sulphide. This must not be done by reducing the color by acid and tin crystals, as sulphide may be produced on long boiling by the decomposition of the color. The best method of testing for free sulphide is to dissolve a little of the color in some caustic soda thickening and allow it to lie for at least an hour on a clean piece of copper foil. If, after washing in boiling water, there is a black stain or cake, then the sample contains free sulphide. Care must be taken in not confusing the black stain with the oxide stain which appears very often on copper after being in presence of a reducing agent.

The sulphide colors usually sent out on the market are not pure color, but are reduced with salt to a 30 per cent or 20 per cent strength, or the doubles of these strengths. It is very rare indeed that pure "conc." color is supplied. In the case of sulphur blues, the strength is usually 30 per cent of the concentrated color, and these are usually in the form of powder.

The following recipe, using the Formosol process, gives good bright results with sulphur colors, such as blues, greens, browns, purples, and

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Boston Office, 419 Shawmut Bank Bldg.

Victoria Blue B
Victoria Blue Base
Crystal Violet 6 B
Paranitraniline

Benzidene Base
Benzidene Sulphate
Dinitro Benzol
Picramic Acid
Benzyl Chloride
Michlers Ketone
Phosgene
Chlorosulphonic Acid
Salicylic Acid Tech.
Phenylalphanapthylamine
Ortho Nitro Phenol
Para Nitro Phenol

Sulphuric Acid
Nitric Acid
Muriatic Acid
Nitre Cake
Salt Cake
Lithopone

khakies containing up to 3 per cent free sulphide:

	Parts
Sulphur blue	60
Caustic soda	20
Hydrosulphite	15
Water	85
Glycerine	100
Thickening	600

Heat to 160-180 deg. Fahr. till dissolved, cool and add:

Formosol, 50 per cent	100
Sulphite of potash, 90 deg. Tw	20
	1,000

Print, age, etc., as for sulphur black for printing.

In printing these colors, which contain slight traces of sulphide, it is advisable to run as little color in the box as is possible, so the fresh stock should always be added slowly. This prevents to a certain extent the overpowering of the sulphite by the sulphide which often occurs on long running.

It will be found that most sulphur colors can be run with indigoid vat dyestuffs, and some fairly fast and pleasing results can be obtained. The fastness of these colors to washing and light is good, and exposure to sulphur dioxide, which is always present in town atmosphere, has a brightening effect. Fastness to chlorine and bleaching is very poor, and this is a great drawback to the printing of sulphur colors in pale shades for shirtings.

Certain members of Levinstein's full range of sulphur colors, the Thionol Colors, may be instanced as dyes of this class specially prepared for textile printing. Thionol Black paste for printing is a sulphur-free product adapted solely for calico printing, and Thionol Blues BR and 2BR, which contain less than 3 per cent free sulphide, can be recommended for the production of full shades of navy blue. Other members of the series are Thionol Yellow, Thionol Corinth and Thionol Green, which give very satisfactory results when applied as for Thionol Blue.

A place in the list of fast dyes should be given, by every calico printer, to the sulphur dyestuffs, and all prejudice should be dropped against them and equal chance with their very expensive rivals, the Thioindigo colors, should be accorded them.—*Dyer and Calico Printer.*

THE USE OF ACID COLORS IN THE "DRY" DYEING PROCESS

By M. Fort, M.Sc.

The winner of Prize Problem No. 26, 1916-17, of the Society of Dyers and Colourists, Bradford, England, proved to be Mr. Fort, whose paper with the above title is herewith reproduced as it appeared in the *Journal* of the Society recently:

The remarkable penetrating powers

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Prompt or Contract

DYE PRODUCTS & CHEMICAL CO., Inc.

200 FIFTH AVE, NEW YORK WORKS: NEWARK, N. J.

of carbolic acid and related phenols when applied to animal fibres, and the observation that many acid dyes can be dissolved in these solvents, has led to a method of "dry" dyeing acid dyes on animal fibres.

So far as the term "dry" dyeing has any significance, it means dyeing from non-aqueous solvents but does not preclude the presence of traces of water if the amount is not such as to produce the undesirable effects of an aqueous bath. The author has satisfied himself that stable shades cannot be obtained with acid dyes on animal fibres when there is complete absence of water. The phenols in a quite "dry" state, viz., pure, re-distilled, do not readily dissolve acid dyes, but commercial phenol and cresol frequently dissolve considerable quantities. The amount of moisture required by this method is not so large as is present in the well-known expensive alcohol-benzine method of Farrell and May.

Commercial cresol b.p. 190-200 deg. Cent., free from tar, has been found the cheapest and most satisfactory phenolic solvent. In normal times cresol was about the same price as benzoline, and as its recovery is a feature of this process, its use has practical interest. Cresol alone or with 5 per cent of water added, is unsuitable for use on account of its shrinking action on animal fibres, especially wool. On the other hand, no tendency to curl was shown by immersing unstretched* cross-bred yarn, even at 100 deg. Cent., a severe test. Shrinkage is accompanied by an increase in tensile strength and elongation, as well as in thickness of the fibre. In the case of wool there is a pronounced development of scales with increased felting properties. *Example*—Yarn averaging 12 oz. strength and 1.22 in. elongation, after immersing in cresol for half an hour at 70 deg. Cent., gave the figures 19 oz. and 3.07 in.

It was found that various non-aqueous solvents can be employed as the main constituent of the bath in dyeing along with smaller quantities of a cresol solution of the dyestuff, and in this way animal fibres are protected from shrinkage, and benzene, benzoline, solvent naphtha, nitrobenzene, have been found suitable. To obtain fastness comparable with that obtained by the ordinary method of applying acid dyes, the temperature should be raised to, say, 50 deg Cent., and a preference is declared for high boiling-point naphtha (over 100 deg. Cent.) as the main constituent of the bath on that account.

*The yarn was loose during immersion and had not been set by previous stretching whilst immersed in boiling water. Aqueous immersion caused it, when loose, to curl and twist into an almost inextricable tangle.

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Nitro-benzene may be used where a higher temperature is required or for penetrating very thick dense materials. Many commercial acid dyes can be dissolved in cresol containing 2 per cent (or less) formic acid (commercial), and dyeing proceeds well in such a bath, but there is considerable shrinkage of fibre. However, the addition of 2 volumes (200 per cent) naphtha inhibits shrinkage while allowing of good dyeing still taking place. In separate treatments at 50 deg. Cent. shrinkage of wool was reduced from 14 per cent to less than 1 per cent in this way, while dyeing at 80 deg. Cent. with 5 volumes of solvent naphtha also proceeded without shrinkage of the fibre. It may be pointed out that the improved strength and elongation of wool dyed as above described favors the subsequent stretching and "getting-up" of garments after dyeing. Heavier shades are obtained when the amount of formic acid used is increased. Penetration and levelling even on goods unevenly exposed to light ("fades") is very good, and the fastness of the shades to rubbing, water, soap solutions, and agencies in general, is equal to that obtained by "wet" dyeing.

Typical dyebaths are as follows:

(1) Blue shades.—These may be dyed from a bath containing 0.1 part of Patent Blue superior, 0.5 part water, 0.5 part formic acid, 10 parts cresol. These are to be mixed in the order named, warmed, and the solution agitated with solvent naphtha, making up to 100 parts. Dyeing is performed at 50 to 80 deg. Cent. for from 5 to 30 minutes. A fine delaine garment dyed thus does not shrink or alter in length or width, and the shade is equal to that obtained in the piece by "wet" dyeing.

(2) Yellow Shades.—These are obtained by dyeing in a bath made as in (1) above, using Naphthol Yellow S as the dye. Less dye is required for most shades, and if the bath is to remain clear only half as much solvent naphtha.

(3) Red Shades.—These may be dyed similarly using Crystal Ponceau or Crystal Scarlet. The above proportions may be varied, but in all cases the actual amount of water present must be kept down to the minimum consistent with obtaining a genuine fast shade. Benzoline and nitrobenzene can be substituted for solvent naphtha, but there is a limitation imposed on the working temperature, while rather more water is also required. The most satisfactory shades are those obtained by use of solvent naphtha as the diluent.

(4) Mixed Shades dyed with the three dyes mentioned are level and quite satisfactory. In such baths silk, pure or weighted, is dyed level bright shades and is also highly scrooped and brightened. Cotton, if present, is stained without being tendered or otherwise affected.

(5) Black Shades.—The dyeing of a good black is more difficult but good results were obtained with Nerol B (Ber.). No doubt British firms can supply a substitute for this dye if desired. Dyeing was performed

A limited number of samples received for analysis, and working formulae furnished for their reproduction.

Confidental advice to chemists, superintendents and assistants, on matters pertaining to the industry.

Dr. Charles B. Davis
Care of American Dyestuff Reporter
470 Fourth Ave., N. Y. City

in a bath containing 1 part dye, 2 parts water, 2 parts formic acid, 30 parts cresol, and this mixture was made up to 100 parts with solvent naphtha. Dyeing was carried out at 80 deg.-85 deg. Cent. for half an hour. The blue-black shade obtained was fast to rubbing and hot or cold water, and to weak soap.

The general procedure after dyeing consists of squeezing or centrifugal extraction, followed by a thorough rinse with benzoline or naphtha to which 5 per cent cresol is added. This latter ensures fastness to rubbing, and may be repeated if loose dye is present. Subsequently ordinary dry-cleaning is resorted to for complete removal of the cresol. The smell of formic acid may persist up to the drying-off but has not been noticed afterwards. It is proposed to recover the cresol and volatile solvent by fractional vacuum distillation. In actual use of standing baths, to keep them clean, it would be necessary to dry-clean all goods before dyeing.

Official Note.—A sealed communication deposited with the Society by Mr. Fort on March 21st, 1914, is in all essentials identical with the above paper and contains dyed samples illustrating his process.

INQUIRY DEPARTMENT

All classes of chemical work or advice relating to artificial colors, natural dyestuffs, dyewoods, raw materials, extracts, intermediates, crudes, or dyeing chemicals and accessories in general, will be carried out for readers and subscribers of the AMERICAN DYESTUFF REPORTER by this department.

Inquiries of a minor character will be answered on this page, while major matters involving personal investigation, analyses, perfected processes and working formulas, will, if desired, be treated confidentially through the mails. All questions, materials for analysis or letters leading to the opening of negotiations for special work will receive prompt attention if addressed to Inquiry Department, American Dyestuff Reporter, 470 Fourth Avenue, New York City.

W. H. D.—Question—What class of colors are known as "vat dyestuffs?"

Answer—The vat dyestuffs at present known are all members of one of the two following classes:

(1) Anthracene class, such as the indanthrene and most of the algole series.

(2) Indigoid class, being indigo and its derivatives; the thioindigo series, the ciba series and the helindone series.

H. W. N.—Question—How can we obtain clearer whites when using tin-resists in diazo-naphthol dyeing?

Answer—If you will add glucose to the stannous chloride resist, it will greatly lessen the fixation by the tin of decomposition products form by the action of this tin salt on the diazo-compound.

E. A. W.—Under separate cover we

FRED WETZEL & CO. N.Y.

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SIZINGS—FINISHINGS—SOFTENERS

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Jersey City, N. J.

are sending you a sample of cotton goods dyed with sulphide black, in which please determine the sulphur before and after exposure to air.

Answer—The cotton goods was washed and dried and a portion tested for free sulphur. The balance was then exposed to a current of moist air at 70 deg. Cent. for 24 hours, after which it was again washed and the sulphur determined with the following results:

Free sulphur before exposure to air.....0.675%
Free sulphur after exposure to air.....0.810%

NOTES OF THE TRADE

A movement is on foot in Canada, headed by Dr. McCallum, chairman of the Advisory Research Council, to establish a central research institution at Ottawa for the benefit of the textile and other industries. An appeal is being made by Dr. McCallum to the textile people to interest themselves on the ground that progress can be greatly accelerated by properly conducted research in the dyeing, bleaching, printing and finishing branches of the industry.

The New Jersey Zinc Company has announced that the general offices of that concern have been removed to 160 Front Street, New York City, where they will occupy a seven-story office building erected for the company's exclusive use. The structure is of brick and provides considerably more space, rendered necessary by the expansion of business, than did the former offices. Modern conveniences, including luncheon and rest rooms, have been installed for employees. A demonstration room, a library and a museum are also provided, one of the features of the last-mentioned being a permanent exhibit of the company's products and their applications.

With a capital of $75,000, the Newton Combing Company has been incorporated under the laws of Massachusetts to scour, carbonize, comb and otherwise prepare wool for manufacture into yarn, wool and wool waste. Headquarters will be located at Newtonville, that State.

To manufacture and deal in alkalies and chemicals, the American Nitration Company has been incorporated under the laws of New Jersey with a capital of $50,000. Headquarters of the new concern will be in Newark.

Announcement has been made by the S. & M. Dye Works, Inc., which was recently incorporated under the laws of Pennsylvania, that this company has acquired the business of the Quaker Dye & Bleach Works, together with its plant and equipment, at 3435 Richmond Street, Philadelphia.

A new house organ has made its appearance in the field, this time from the New York offices of the American Woolen Company, which is of pleasing aspect and is known as "Amwoolco Yarns." The newcomer is published once a month, and is devoted to the interests of the company.

Dr. M. O. Forster, F.R.S., has been appointed Director of Institute of Industrial Chemistry recently established by the Salter's Company in England.

The Dye Products & Chemical Company, 200 Fifth Avenue, New York City, has acquired a plot of ground on Vanderpool Street, Newark, N. J., adjoining its plant, and is planning an extensive enlargement of its manufacturing facilities.

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